20-118-6-18/43

AUTHOR: Smagin, A. G.

TITLE: On the Creation of a Monofrequency Oscillation System (K voprosu sozdaniya monochastotnoy kolebatel'noy sistemy)

PERIODICAL: Doklady Akademii Nauk SSSR, 1953, Vol. 118, Nr 6, pp. 1116-1117 (USSR)

ABSTRACT: In modern pulse radio engineering the quartz generators which create an electric time scale gained a great importance. Quartz resonators of special monofrequency and precision are to be used for the construction of precision time scales. Previous papers dealing with the same subject are pointed to. A previous paper by the author (ref 4) describes such precision quartz resonators. They consist of quartz lenses which in their neutral plane are fitted in a special attachment and placed in an evacuated ballon. Such a precision oscillation system is a monofrequency system. It was assumed that in the case of an anisotropic crystal all other oscillations except the fundamental vibration are compensated and suppressed. Then the dissipative component of the energy losses is very small and

Card 1/3

the Q-factor of the system reaches its maximum value. Such an accordance to certain rules is observed in fact and the dependence of the Q-factor on the geometrical properties of the lens was detected on the basis of the experimental data. The maximum value of the Q-factor depends on the frequency. At a the frequency of 500 kilocycles the Q-factor has its maximum value $Q = 17,5.10^6$ at $a/R = 0,38$ (whereby a denotes the diameter of the lens and R the radius of curvature). The maximum value of Q can be detected for any frequency by variation of a and R. The dissipative component of the energy losses which is due to the existence of coupled vibrations in the system equals zero, however, only in the case of certain geometrical properties of the lens fastening. The optimum geometrical properties are therefore a necessary, but not a sufficient condition that the quartz lens is a monofrequency system. A diagram illustrates the dependence of the dissipative component of the energy losses on the kind of fastening of the lens obtained by the rotation of the lens in its neutral plane. A quartz lens is in a wide temperature range a monofrequency

SMAGIN [illegible]

11 [illegible]

(с 1[illegible] до 2[illegible] часов)

[illegible]

[illegible]

С. [illegible] Афанасьев

[illegible]

А. [illegible]

[illegible]

[illegible] С. [illegible]

[illegible]

1[illegible] [illegible]

(с 10 до 16 часов)

[illegible]

[illegible]

[illegible]

[illegible]

Г. Д. [illegible]

[illegible] СВЧ [illegible]

А. [illegible]

[illegible]

С. С. [illegible]

[illegible]

А. [illegible]

[illegible]

[illegible]

Д. [illegible]

[illegible]

[illegible] СЕКЦИЯ РАДИОИЗМЕРЕНИЙ

Руководитель Г. Д. [illegible]

9 [illegible]

(с 10 до 16 часов)

А. Г. [illegible]

О [illegible]

Report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov ([illegible]), Moscow, 8-12 June. 1959

24.7100

SOV/[illegible]

AUTHOR: Smagin, A. G.

TITLE: Methods for Reducing Energy Dissipation in the Surface Layer of Quartz

PERIODICAL: Kristallografiya, 1959, Vol 4, No 6, pp 862-866 (USSR)

ABSTRACT: Q-factor, on which the stabilizing properties of quartz basically depend, can be increased by reducing dissipation losses or increasing the amount of reactive energy. Cutting, grinding, and polishing cause deformations and internal stresses in the surface layer, and consequently give rise to higher scattering of elastic waves and increase dissipation. The latter also increases with increasing roughness height of a surface. Cutting, grinding, and polishing produce near-surface layers in the following order (Fig. 1): monomolecular film with adsorbed particles; (2) ductile film produced as a result of polishing, about 50 A thick;

Card 1/4

Methods for Reducing Energy Dissipation in the Surface Layer of Quartz

SOV/70-4-6-10/31

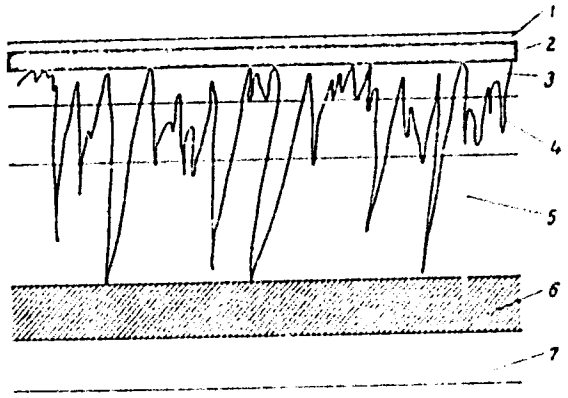


Fig. 1

(3) layer with grooves produced by polishing, under 100 A thick; (4) layer with irregularities produced by grinding, 0.18 μ.; (5) layer with irregularities produced by cutting, 0.25 mm; (6) layer with structure distortions; (7) quartz as grown. Layers 5 and 6 could be greatly reduced by deep grinding with fine-grained (5-7 μ in diameter) abrasive M7, and layer 4, by etching with 20%

Card 2/4

HF solution for 30 min prior to polishing. Polishing with annealed crocus (iron oxide) on felt and subsequent etching with $K_2F_2 + H_2O$ reduced the thickness of the surface layer still further. Annealing in vacuum reduced structure distortions in the surface layer. The above treatment and measurements that followed proved that with the duration of polishing Q-factor asymptotically approaches to a constant value. In other words, just as roughness within 300-900 A does not affect the optical properties of a polished glass surface, so a deformed surface layer of a certain minimum thickness does not raise energy dissipation in quartz. The electron micrographs revealed that etching dissolves crushed matter and amorphous film and exposes the rough surface of the crystalline layer covered by scattered crystal nuclei, and broken into blocks separated by grooves about 1 μ deep. The above procedure increased the Q-factor of quartz lenses, bars, Essen's and torus rings, up to 5 to 20.10^6. V. K. Vaynshteyn's assistance is acknowledged. There are 5 figures; and 4 Soviet references.

Methods for Reducing Energy Dissipation in the Surface Layer of Quartz

77109
SOV/70-4-6-10/31

ASSOCIATION: All-Union Scientific Research Institute for Physico-technical and Radio Engineering Measurements (Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy)

SUBMITTED: June 29, 1959

Card 4/4

82905
S/120/60/000/02/036/052
E032/E414

9.3260

AUTHOR: Smagin, A.G.

TITLE: A Quartz Toroid as an Oscillating Element for the Stabilization of Standard Frequency Generators

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 2, pp 134-135 (USSR)

ABSTRACT: The present author has developed a quartz toroid which can be used to stabilize the standard frequency generators at the All-Union Scientific Research Institute for Physico-Technical and Radio-Technical Measurements. A quartz toroid has a large Q-factor since its natural frequency is determined by its mean diameter, and a small ageing coefficient. A quartz ring prepared by the Essen method and having a Q-factor of 3.2×10^6 was used to make the toroid with the aid of a rotating face-plate with a semi-toroidal indentation in it. First, one half of the toroid is polished and then the other. The surface treatment is similar to that described by the present author in Ref 4 to 6. The quartz toroid is fixed in three nodal planes at 120° to each other on knife-edge supports, as shown in Fig 1. The toroid is

Card 1/4

4

82905
S/120/60/000/02/036/052
E032/E414

A Quartz Toroid as an Oscillating Element for the Stabilization of Standard Frequency Generators

excited by sectional electrodes, the inner electrode being located concentrically with the outer one. The inner electrode is attached to a micrometer screw which can be used to vary the coupling between the quartz toroid and the generator circuit. The toroid is excited in a three-tube oscillator in which it is included in a four-pole negative feedback circuit. The Q-factor of the quartz toroid was found to be 7.4×10^6, and the temperature coefficient of frequency 6×10^{-7} (in the temperature region between -7 and +16°). The dimensions of the toroid are: external diameter 61.55 mm; internal diameter 44.35 mm, radius of cross-section 4.05 mm. Fig 2 shows the dependence of the frequency of the quartz toroid on the anode voltage at constant tube filament voltage and Fig 3 shows the dependence of the frequency on the tube filament voltage at fixed anode voltage (curve 1 · 50 V;

Card 2/4

82905
S/120/60/000/02/036/052
E032/E414

A Quartz Toroid as an Oscillating Element for the Stabilization of Standard Frequency Generators

curve 2 - 100 V; curve 3 - 150 V; and curve 4 - 200 V). As can be seen from Fig 3, the relative dependence of the frequency of the toroid on the anode voltage is 5×10^{-10}. If the toroid is thermostated in an underground enclosure at a depth of 25 m to within $\pm 0.0001^{\circ}C$, the effect of temperature as a de-stabilizing factor can be reduced to $\Delta f/f = 6 \times 10^{-11}$. It is claimed that the quartz toroid can be used to stabilize standard frequency generators and that it will have an instability and ageing coefficient smaller than those reported by the British National Physical Laboratory and the British General Post Office. There are 3 figures and 9 references, 6 of which are Soviet and 3 English.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute for

Card 3/4

82905
S/120/60/000/02/036/052
E032/E414

A Quartz Toroid as an Oscillating Element for the Stabilization of Standard Frequency Generators

Physico-Technical and Radio-Technical Measurements)

SUBMITTED: February 27, 1959

Card 4/4

83528

S/115/60/000/009/008/011
B012/B054

9,2180

AUTHOR: Smagin, A. G.

TITLE: Investigation of High-quality Quartz Rods

PERIODICAL: Izmeritel'naya tekhnika, 1960, No. 9, pp. 48-51

TEXT: Quartz rods with Y cross section and with a quality factor of $10-25 \cdot 10^6$ were developed at the Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physics, Technology and Radio Engineering Measurements). They are described here. A schematic sectional view of a vacuum cylinder with such a quartz rod is shown in Fig. 1, and the corresponding circuit in Fig. 2. With the aid of these figures, the author explains the mode of operation of the circuit. Two faces of the quartz rod are fastened to four small glass rods by means of silk threads. The glass rods are fused onto the floor. The round exciting nickel electrodes are also fastened to these glass rods. The quartz rods are excited in the Pirs circuit at the 2nd harmonic with a frequency of 100 kc/s. The error

Card 1/3

of measurement of the instrument described was about 1%. As compared with the instrument described in Ref. 1, the instrument described here offers the possibility of measuring the quality factor within a wide frequency range from 50 to 1000 kc/s, and of using an electronic relay. The quartz rods with an oscillation frequency of 100 kc/s produced at the KhGIMIP in 1958 attained a quality factor of $1.9 \cdot 10^6$. They were surface-treated as described in Refs. 3, 4, and attained a quality factor of $4\text{-}5 \cdot 10^6$. Referring to Refs. 2, 5 it is pointed out that the quality factor of the quartz rod will reach a maximum at a certain chamfering width. It is not yet possible to calculate this effect theoretically. Therefore, it is recommended to select the corresponding conditions by way of experiment. It was possible to attain a quality factor of $23\text{-}25 \cdot 10^6$ with individual quartz rods. The author also studies the dependence of the quartz resonator quality on the introduction of various dielectrics into the field between exciting electrodes and quartz element. It was shown that with the introduction of a polished quartz rod the quality decreased only to $8.7 \cdot 10^6$. Hence, it appears that quartz as a dielectric offers the smallest losses (as compared with glass, plexiglass, etc.). Moreover, the author studied the influence of the fastening of quartz rods on the quality factor. The temperature

83528

Investigation of High-quality Quartz Rods S/115/60/000/009/008/011
B012/B054

coefficient of the quartz rod frequency (of the type described) vanished at 38-42°C. It may be assumed that in quartz rods with X-cross section the temperature coefficient vanishes within a wide temperature range. It may also be assumed that causes of aging on the quartz surface are practically excluded with the methods of treatment applied. Nevertheless, it is necessary to reduce to a minimum the aging due to continuous elongation of the threads (by which the quartz rods were fastened). In this connection, the author carried out investigations of three types of thread (silk, caprone, and perlon); these investigations are briefly described. Fig. 4 shows the aging curve of the silk thread under load. It is recommended to use silk threads since their aging rate does not change with loads of 50 gauss upwards. There are 4 figures and 7 references: 6 Soviet and 1 German.

Card 3/3

SMAGIN, A.G.

Internal friction in quartz. Kristallografiia 6 no.5:686-691 S-O '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy.
(Crystallography) (Quartz)

BR

ACCESSION NR: AT4026431 S/2589/62/000/059/0018/0036

AUTHOR: Smagin, A. G.

TITLE: Investigation of the properties of quartz resonators

SOURCE: USSR. Komitet standartov, mer i izmeritel'ny*kh priborov. Trudy* institutov Komiteta, no. 59(119), 1962. Issledovaniya v oblasti izmereniya chastoty* (Investigations in the field of frequency measurement), 18-36

TOPIC TAGS: frequency measurement, quartz, quartz resonator, resonator, resonance frequency, frequency generator, Q factor, crystal resonator

ABSTRACT: The author enumerates the properties required of high-precision crystals resonators used in high-stability frequency generators and in the selective curcuits of different kinds of radio equipment. These include: high Q, a minimal temperature coefficient of frequency, low dependence of frequency on feed voltages, reduced initial aging period and a mono-frequency characteristic. Each of these properties of a crystal resonator is considered in the present article, with particular attention to the Q-factor. It is shown that the Q of the resonator is one of the primary causes of its stabilizing properties. The problem of internal friction in quartz crystals and the possibility of achieving oscillating systems with a very small logarithmic decrement of decay are considered

Card 1/4

ACCESSION NR: AT4026431

along with the question of the fluctuation limit of crystal generator frequency stability. The point is made that a high crystal resonator Q-factor is the first prerequisite for high frequency stability. The importance of the temperature coefficient of frequency is analyzed in this connection and it is shown that, in order that this factor be kept low, it is essential that each crystal element be individually selected with respect to the optimal values of its geometric dimensions and the distance between it and the exciting electrodes. The possibility of reducing the effect of so serious a destabilizing factor as temperature to a value of $1-3\cdot10^{-12}$ is discussed. A low temperature coefficient of frequency is, therefore, the second prerequisite for high frequency stability. The third prerequisite, according to the author, is independence of the crystal resonator frequency on the driving current which flows through the resonator itself. The problem of aging and aging rate is also considered in this section of the article, and it is noted that the aging for 40 years at 77K will be smaller than that for 0.1 second at 50C. It is claimed that the use of crystal rings as oscillating elements, having an aging of $2-4\cdot10^{-11}$ per 24-hour period, with these rings cooled to the temperature of liquid helium, permits a considerable reduction in the rate of aging. In the next section of the paper, the role of quartz surface processing as a means of obtaining a maximum Q-factor is discussed in detail. It is pointed out that the Q-factor of the quartz crystal element may be heightened by increasing the reserve of

Card 2/4

ACCESSION NR: AT4026431

reactive energy or by reducing the dissipative losses, particularly in the surface layer of the crystal. The cause of energy dissipation in the surface layer of the quartz is the presence of a strain layer in which the elastic waves are scattered. The value of the microrelief and the voltage in the surface layer are uniquely related: the greater the depth of the microrelief, the greater the value of the voltages in the surface layers. Different techniques for surface machining (abrasive grinding, polishing, chemical agent treatment, etc.) are considered in the body of the text and pertinent data based on their use are analyzed and interpreted in terms of the resultant Q-factor influence. The section concludes with the statement that certain of the methods which have recently been developed (of a chemical nature, primarily) have been used to increase the Q-factor of other types of resonators as well (lenses, bars, Essen rings and toroids as quartz elements). The author claims that he succeeded in achieving a Q-factor for these elements of $5\text{-}20\cdot10^6$. The next subject to be considered is the causes of the change in the frequency of crystal resonators in the presence of feed voltage fluctuations. The problem is formulated in the following terms: what value of the current driving the crystal resonator is permissible in order to reduce as far as possible the effect of this destabilizing factor? The author concludes that a crystal resonator is a practically isochronous oscillating system. Two frequency variation effects exist for the crystal resonators considered in the discussion: the first is nonlinear and its cause lies in the continuous formation and development of nonstable Frank-Reed dislocation loops at a quartz-driving current above 1 microamp/mm;

Card 3/4

ACCESSION NR: AT4026431

the second is linear and its cause is to be found in the fact that there is a change in frequency as the crystal is heated by an exciting (driving) current with a value of less than 1 microamp/mm. The final section of the report deals with certain methods for creating a single-frequency oscillating system in the light of the fact that the crystal resonators, used as filters in the selective circuitry of various types of radio equipment, must possess narrow band and single-frequency characteristics. It is shown that, in actuality, the monofrequency effect of an oscillating system is really the presence of one resonance frequency predominating over the partial frequencies. In this case, the physical characteristic of such a system is the minimal logarithmic decay decrement under specific conditions. A relation is also noted between the resonator Q-factor and the gap values between the surface of the quartz element and the driving electrodes (at constant intervals between the resonance and partial frequencies). Orig. art. has: 14 figures and 23 formulas.

ASSOCIATION: Komitet standartov, mer i izmeritel'ny*kh priborov (Committee for Standards, Measures and Measuring Instruments)

SUBMITTED: 00Apr60 DATE ACQ: 24Apr64 ENCL: 00

SUB CODE: GE, AS NO REF SOV: 012 OTHER: 010

Card 4/4

ACCESSION NR: AT4026432 S/2589/62/000/059/0037/0045

AUTHOR: Smagin, A. G.

TITLE: The investigation of high-quality quartz bars

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy* institutov Komiteta, no. 59 (119), 1962. Issledovaniya v oblasti izmereniya chastoty* (Investigations in the field of frequency measurement), 37-45

TOPIC TAGS: frequency measurement, quartz, quartz bar, frequency generator, crystal resonator

ABSTRACT: The article contains a report on the results of tests of high-Q quartz bars developed at the Vsesoyuzny*y nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physico-Technical and Radio Engineering Measurements). The importance of crystal resonators for high-stability standard-frequency generators and crystal clocks is discussed in the light of the present-day use of molecular generators and cesium frequency standards. The Y-bars described in the article (see Fig. 1 in the Enclosure) had a Q-factor of $10-25\cdot10^6$ and were connected in two junction planes, by means of natural silk threads 20-35 microns in diameter, to four glass pins soldered to the base (see Fig. 2 in the Enclosure). The

Card 1/6

ACCESSION NR: AT4026432

driving nickel electrodes were of circular form and were fastened to the same pins as were the bars. The quartz bars were excited in a Pierce circuit on the second harmonic at a frequency of 100 kc. The test instrument, which is described in detail in the article, had an error of measurement on the order of 1%. A distinguishing feature of the apparatus was the ability to measure Q-factors in a broad range of frequencies (50-1000 kc). The methods used to treat the surface of the quartz are not described in this article; however, pertinent bibliographical references are given. The author discusses the fact that there exists for a crystal resonator, as an anisotropic oscillatory system, an optimal geometry at which the Q-factor will be maximum. In this connection, the intervals on the frequency scale between the fundamental and parallel frequencies are so expanded that bound oscillation losses in the system decrease sharply as a result of the reduced interaction between them. It is also established that grinding off the champfered faces on the bars leads to an increase in the interval between the fundamental frequency and the frequency of the torsional vibrations to 4.6% (as opposed to an original interval of 0.5%) and to higher Q. The effect of the width of the gap between the surface of the quartz element and the electrodes which excite it, as well as the Q-factor of quartz bars as a function of the length

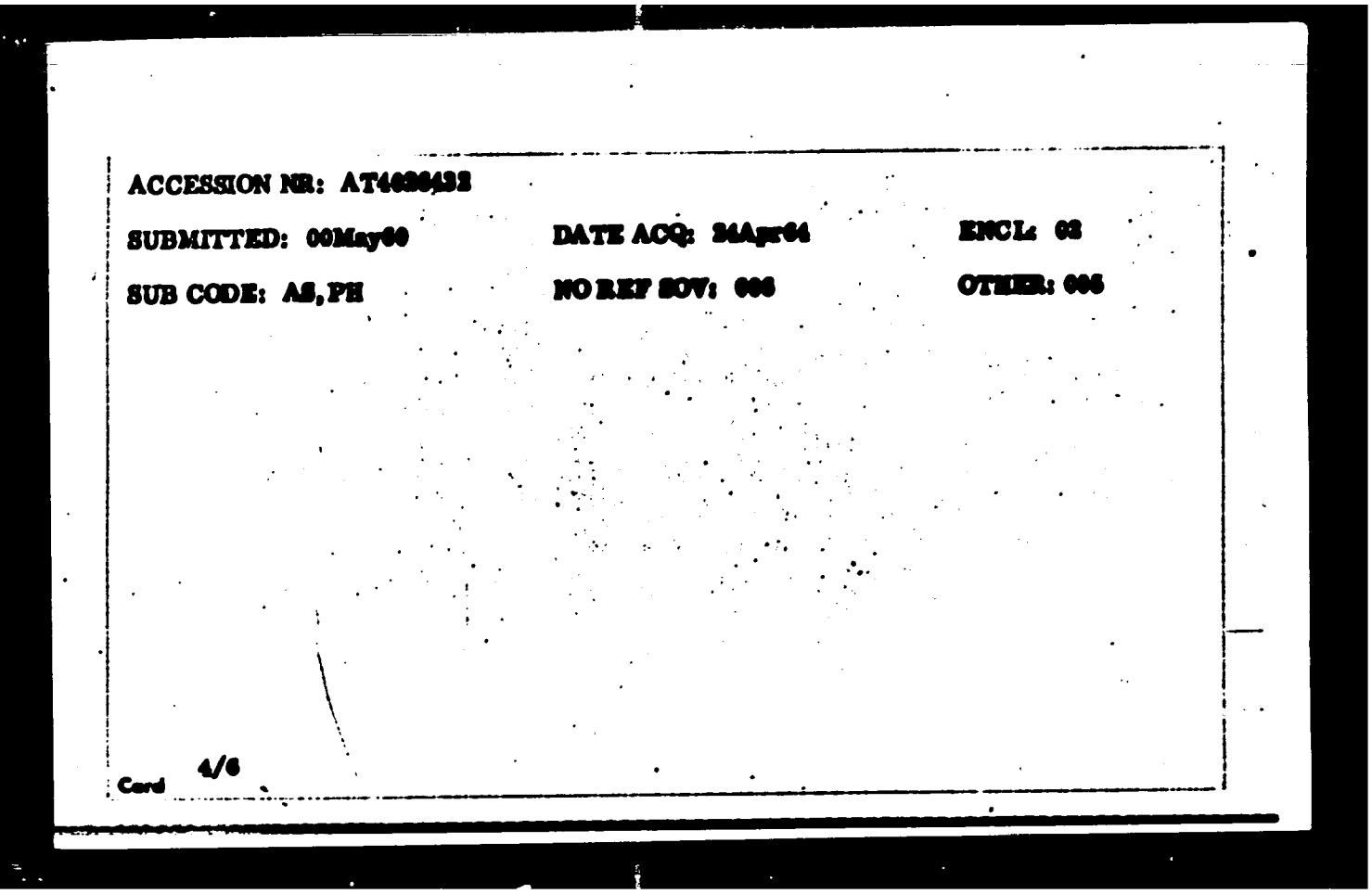
Card 2/6

ACCESSION NR: AT4026432

of the outer and center electrodes are also considered. The author succeeded in exciting individual samples of quartz bars with a 52.2-mm interval between the bars and the driving electrodes; the Q-factor, in this case, reached $23-25\cdot10^6$. Further, an analysis was made of the dependence of the Q-factor of quartz bars on the introduction of various dielectrics in the field between the electrodes and the quartz element. It was found that, as a dielectric, quartz has the smallest losses. The author also analyzed the influence on the Q-factor of fastening the quartz bars together. The test method used for this purpose is described in the article. The temperature coefficient of frequency of the bars described in the article equalled zero in a temperature range of 38-42C. The author claims that there is reason to believe that a zero temperature coefficient of frequency in an interval of 0-20C can be achieved for quartz X-bars, through proper variation of the cut, gap and geometry of the bar. Some consideration is given in the article to the general problem of aging and the effect of generator feed voltage fluctuations on the relative deviation of the quartz (crystal) resonator frequency. In the latter connection, for example, it was found that $\frac{\Delta f}{f} = 2\cdot10^{-10}$ in the presence of feed voltage variations of 1%. Orig. art. has: 15 figures.

ASSOCIATION: Komitet standartov, mer i izmeritel'nykh priborov (Committee for Standards, Measures and Measuring Instruments)

Card 3/6



ACCESSION NR: AT4020432

SUBMITTED: 00May60 DATE ACQ: 24Apr64 ENCL: 02

SUB CODE: AS,PH NO REF SOV: 006 OTHER: 006

Card 4/6

9.2181

S/020/62/143/002/013/022
B104/B102

AUTHOR: Smagin, A. G.

TITLE: High-quality and high-stability quartz resonators as a USSR state frequency standard

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 2, 1962, 323 - 326

TEXT: The frequency standards described here are Y-cut quartz bars with a Q factor of $(10 - 30)\cdot 10^6$, 54.3 mm long and 7.8 mm wide and high. The bars are suspended from silk threads (20 - 35μ) on the two nodal surfaces. The quartz resonator consists of the quartz bar, the threads, the electrodes, and a vacuum bulb. A Pierce circuit is used to excite the bars to the second harmonic (100 kc/sec). During the measurement, the resonator is switched over to an automatic circuit with input reactance, which measures the damped free oscillation period. The damped oscillations are amplified by a cathode follower and fed to a detector. The error in measurement is 1%. At a definite width of the bar faces, the Q factor reaches a maximum which cannot be fully explained theoretically. Ground quartz bars, glass, Plexiglas, and molybdenum

Card 1/3

glass were tested as dielectrics between square electrodes (30 by 30 mm) and the quartz bars. Quartz as a dielectric showed minimum loss. An optimum length of thread could be obtained for the Q factor. The relative variation of frequency with a change of supply voltage by 1% is given by $\Delta f/f = 2 \cdot 10^{-10}$. There are 4 figures and 8 references: 2 Soviet and 6 non-Soviet. The four references to English-language publications read as follows: J. M. Schaull, J. H. Shoaf, PIRE, 42, no. 8 (1954); A. G. Smagin, Quartz Toroid as a Vibrating Element for Stabilization of Frequency Oscillators; High Quality and High Stability Quartz Bars for USSR State Frequency Standards; Physical Bases and Methods of Decrease of Energy Dissipation and Unstability of Quartz Resonators for Frequency Standards; Reports of XIII London General Assembly URSI, 1960.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physicotechnical and Radiotechnical Measurements)

PRESENTED: February 17, 1961, by A. V. Shubnikov, Academician

S/020/62/143/002/013/022
B104/B102

High-quality and high-stability...

SUBMITTED: October 25, 1960

Card 3/3

SMAGIN, A.G.; VYSOKOSOV, Ye.P.

Excitation of quartz lenses with gaps in a parallel field.
Izm.tekh. no.3:57-59 Mr '63. (MIRA 16:4)
(Oscillators, Crystal)

SMAGIN, A.G.; NIKOL'SKAYA, V.I.

Effect of electrical precipitation on the damping decrement in quartz. Kristallografiia 8 no.3:475-476 My-Je '63. (MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy.

L 10413-66 EWT(1)/EWP(e)/EWT(m)/EWP(h)/EWA(h) WH UR

ACC NR: AM5012956 BOOK EXPLOITATION

Smagin, Aleksandr Gerasimovich

Quartz precision resonators; physical principles (Pretsizionnyye kvartsovyye rezonatory; fizicheskiye osnovy), Moscow, Izd-vo Standartov, 1964, 238 p. illus., diagm., tables, biblio., index. 3,000 copies printed.

TOPIC TAGS: solid state physics, piezoelectric effect, quartz precision resonator, acoustics, frequency

PURPOSE AND COVERAGE: This monograph discusses the present status and development of precision quartz resonators. Investigations of their basic properties are described. Special attention is paid to energy dissipation in the crystal surface layer and in the area of contact of the crystal with its support as well as to the coupled vibrations. Methods for the experimental investigation of internal friction in quartz at room and low temperatures are discussed. Various disturbing factors are analyzed to discover the critical properties of precision quartz resonators for frequency standards. Irreversible processes in resonators (aging) and the reasons causing these processes are considered. Means of improving the quality and stability of resonators are discussed. Particular attention is paid to certain problems of solid state physics. This monograph can be used as a reference book. The author acknowledges the contributions by Shubnikov, A.V. (Academician); Groys, O.Sh., Bogdanova, E.A. The book is designed for engineers of various specialties, scientific workers connected with the piezoengineering and frequency stabilization, aspirants, and advanced students at institutions of higher learning.

UDC:534.133.043.06

Card 1/2

L 10413-66

ACC NR: AM5012956

TABLE OF CONTENTS [abridged]:

SUBMITTED: 03Nov64 SUB CODE: SS, GP NO REF SOV: 117

OTHER: 172

Card 2/2

SMAGIN, A.G.; VIZEN, F.I.

Quartz bars of X, o, ψ-cut for underground oscillators. Izm. tekh. no.5248-50 My'54 (MIRA 17:7)

ACC NR: AT6020235 (N) SOURCE CODE: UR/2909/65/000/077/0058/0062

AUTHORS: Smagin, A. G.; Vizen, F. L.

ORG: none

TITLE: Quartz bars cut along the $X_{90°}$, ψ-direction, for underground quartz generators

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta, no. 77(137), 1965. Issledovaniya v oblasti izmereniya vremeni i chastoty (Research in the field of time and frequency measurement), 58-62

TOPIC TAGS: quartz, quartz clock, quartz crystal, vibration frequency

ABSTRACT: Precision crystal quartz frequency generators for use in well thermostated ($\pm$ 0.0001C) conditions, i.e., underground positions, were developed. The generators are made from quartz bars cut along the $X_{90°}$, ψ direction (Ya. Groshkovskiy. Generirovaniye vysokochastotnykh kolebaniy i stabilizatsiya chastoty, M., IL, 1953). The temperature dependence of the frequency of the quartz bars and the magnitude of the frequency coefficient $N(\psi)$ were determined as a function of the angle ψ (see Figs. 1 and 2), where the frequency coefficient $N(\psi)$ is given by

$$N(\psi) = \frac{K}{2Y}$$

ACC NR: AT6020235

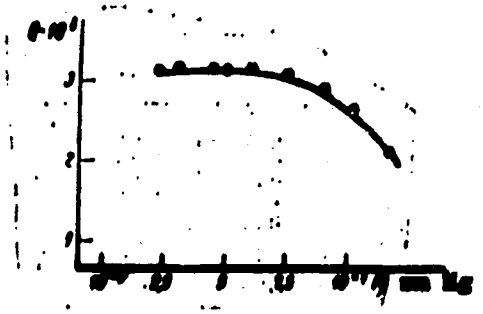


Fig. 3. Dependence of the Q-factor of $X_{90°}$, ψ-cut quartz bar on the pressure

Orig. art. has: 2 tables, 11 graphs, and 2 equations.

SUB CODE: 09, 11/ SUBM DATE: --Jun62/ ORIG REF: 002/ OTH REF: 001

Card 3/3

L 42070-65 EWP(e)/EWT(m)/EWP(i)/EWG(m)/T/EWP(t)/EWP(b) Pg-4 RWH/JD/WH
ACCESSION NR: AP5010860 UR/0286/65/000/007/0035/0035

AUTHOR: Yugov, V. A.; Smagin, A. G.; Vysokosov, Ye. P.; Churkin, Ye. V.

TITLE: Device for depositing metal film electrodes on quartz resonator plates. Class 21, No. 169566

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 7, 1965, 35

TOPIC TAGS: metal film electrode, crystal resonator, resonator electrode, metal spraying

ABSTRACT: The proposed device, for direct deposition of metal-film electrodes in the resonator envelope, comprises a vacuum system with an evaporator and heater. For insertion and removal of the evaporator, a clamping device with sealing gaskets is provided inside the envelope projections. [DW]

ASSOCIATION: none

SUBMITTED: 08Jul63 ENCL: 00 SUB CODE: EE
NO REF SOV: 000 OTHER: 000 ATD PRESS: 3237
Card 1/1 cc

L 29530-65 EWP(e)/EWT(m)/EWP(t) Pq-4 WH

ACCESSION NR: AP5005366 S/0109/65/010/002/0390/0391

AUTHOR: Smagin, A. G.

TITLE: Effect of anharmonicity of the natural frequency of oscillations of quartz

SOURCE: Radiotekhnika i elektronika, v. 10, no. 2, 1965, 390-391

TOPIC TAGS: quartz, quartz resonator, natural frequency, anharmonicity

ABSTRACT: A nonlinear equation of the motion of an oscillatory system allowing for anharmonicity is solved by the successive-approximation method. The anharmonicity contribution is found to be of the order of 10^{-16} cm for 10^{-8}-cm oscillations. As quartz oscillations used in modern precision resonators are higher by several orders than the above anharmonicity value, the effect of anharmonicity in such resonators is practically nil. However, this effect may be considerable in quartz tuning-fork oscillators. Orig. art. has: 6 formulas.

ASSOCIATION: none

SUBMITTED: 30Aug63 ENCL: 00 SUB CODE: EC

NO REF SOV: 002 OTHER: 001

Card 1/1

MEDOVOY, I.L., inzh.; SMAGIN, A.P., inzh.

Voltage regulation in large autotransformers. Elektrichestvo no.9:90-91 S '63. (MIRA 16:10)

SMAGIN, A. V.

SMAGIN, A. V. -- "Investigation of High-Speed Methods of Cutting Deep Grooves in Steel Parts Using Abrasive Disks." Min Higher Education USSR. Moscow Automotive Mechanics Institute. Moscow, 1955. (Dissertation for the Degree of Canididate in Technical Sciences)

So; Knizhnaya Letopis' No 3, 1956

SMAGIN, A.V., kand.tekhn.nauk; ORLOV, P.S., inzh.

Mechanizing the technological processes of winding miniature toroidal cores. Izobr. i rats. no.6:27-29 Je '58. (MIRA 11:9)
(Miniature electronic equipment)

28 (8)

AUTHORS: Smagin, A. V., Candidate of Technical Sciences, Fedorov, A. D., Candidate of Technical Sciences SOV/119-59-7-9/18

TITLE: A Test Stand With Preset Course for Testing Machines of the VK-1 Type for Exactness of Counting

PERIODICAL: Priborostroyeniye, 1959, Nr 7, pp 23-25 (USSR)

ABSTRACT: As for the testing of VK-1 computers very much time is needed (3-3.5 hours for 1 machine), it is necessary to automatize these controls. The price for an automatic test stand with 10 control positions is given as amounting to roughly 75.000 Rubles. Such testing machines as are manufactured by the firms of Rheinmetall and Fazit are then discussed, and it is pointed out that in 1957, in the NIIS-chetmash projecting and investigations were carried out for a test stand with preset course. The instrument consists of executing organs and a station control apparatus; it is said in this connection that the organs of execution, if they are electromagnets, are not economical. In the diagram of figure 1 a comparison is drawn between the efficiency characteristic of electromagnetic and pneumatic organs of execution, and the advantages of the latter are discussed. As a station control apparatus any desired programing system with either magnetic or

Card 1/2

A Test Stand With Preset Course for Testing Machines of the VK-1 Type for Exactness of Counting SOV/11-59-7-9/18

electric band-programing may be used. The feeding mechanism of the T-5 tabulator and of the control device of the type K45-2 were investigated by means of an existing simple and inexpensive test stand, and the results obtained were discussed in detail. The basic scheme of the test stand with preset course for the testing of the VK-1 computer, which is shown in figure 2, is discussed in detail and its mode of operation is explained. Further, figures 3-5 show the control position (control table) of the pneumatic system of the organs of execution as well as a general view. There are 5 figures.

Card 2/2

SMAGIN, Boris Ivanovich; LEVENSHTEYN, G.V., otvetstvennyy red.; KRAVTSOVA, R.M., tekhn.red.

[The atom works] Atom rabotaet. Moskva, Gos.izd-vo detskoi lit-ry M-va prosv. RSFSR, 1957. 92 p. (MIRA 11:3)
(Atomic energy--Juvenile literature)

SHTEYNGAUZ, Aleksandr Izrailevich; LEVENSHTEYN, G.V., otvetstvennyy red.; SMAGIN, B.I., otvetstvennyy red.; KUTUZOVA, M.A., tekhn. red.

[Factory without people] Zavod bez liudei. Moskva, Gos. izd-vo detskoi lit-ry, 1957. 156 p. (MIRA 11:7)
(Automatic control) (Machinery)

SUBJECT: USSR/Nuclear Power - A Book Review 25-5-32/35

AUTHOR: Smagin, B.

TITLE: A Scientific and Popular Book (Nauchnaya i populyarnaya kniga)

PERIODICAL: Nauka i Zhizn' - May 1957, No 5, p 60 (USSR)

ABSTRACT: A critical review of the book "Nuclear Power" by D.I. Voskoboynik. This is not an encyclopedia on the subject but a comprehensive survey of actual nuclear problems. To be able to understand the following chapters, the reader is first briefed on nuclear physics. Then follow the construction principles of nuclear reactors, including a description of the materials they are built of and their special equipment. Special attention is paid to the newly constructed nuclear electric power station operated by the USSR Academy of Sciences and the projected nuclear electric power stations as described by the Soviet and foreign press.

Voskoboynik has succeeded in pointing out all the real important facts about nuclear power, thus making his book easy to understand by anyone.

Card 1/2

25-5-32/35

TITLE: A Scientific and Popular Book (Nauchnaya i populyarnaya kniga)

ASSOCIATION:

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 2/2

LEVENSHTEYN, G.; SMAGIN, B.

Atom city on the Volga. Mol.tekh. no.7:30-34 Je '57. (MLRA 10:7)
(Dubna--Atomic energy research)

SMAGIN, B.(Moskva)

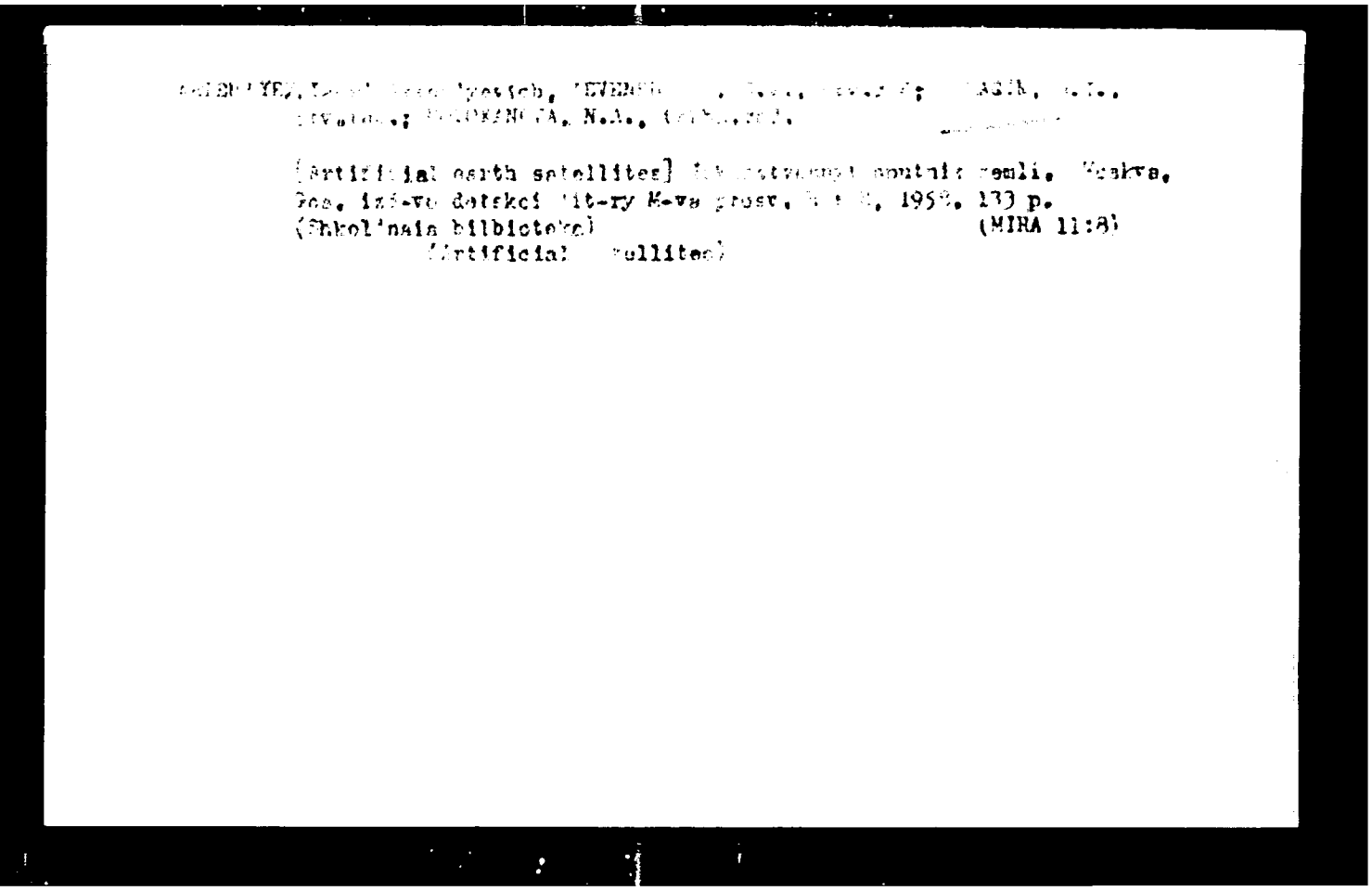
Answer to A.R.Petrakov, Fiz. v shkole 17 no.2:95 Mr-Ap '57.
(MLRA 10:3)

(Nuclear counters)

SMAGIN, B.

In pursiut of invisible particles. Tekh. mol. 25 no.4:14-16 Ap '57. (MLRA 10:6)

(Nuclear counters) (Radioactivity)



[illegible]

[Artificial earth satellites] [illegible] Moskva, Izd-vo detskoi lit-ry Mova proez, [illegible], 195[illegible], 133 p. (MIRA 11:8)
(Shkol'naia bibliotekа)
(Artificial satellites)

GLAIKOV, Kirill Aleksandrovich; LEVENSHTEYN, G.V., otvetstvennyy red.; SMAGIN, B.I., otvetstvennyy red.; TISHINA, Z.V., tekhn. red.; SUCHKOVA, N.V., tekhn. red.; MOLOKANOVA, N.A., tekhn. red.

[Energy of the atom] Energiia atoma. Moskva, Gos. izd-vo detskoi lit-ry M-va prosv. RSFSR, 1958. 397 p. (MIRA 11:8)
(Atomic energy—Juvenile literature)

SMAGIN, B.

Very near to the sun. Izobr.i rats. no.11:36-38 N '58. (MIRA 11:12)
(Nuclear engineering)

AUTHORS: Smagin, B., Levenshteyn, G. 29-58-6-6/19

TITLE: Chasing the Invisible (V pogone za nevidimkoy)

PERIODICAL: Tekhnika Molodezhi, 1958, Vol 26, Nr 6, pp 8-11 (USSR)

ABSTRACT: The periodical "Tekhnika moledezhi", 1957, number 4, reports on ionization apparatus and neutron counters. Special attention was paid to the Geiger counter. In the entire nuclear physics there is scarcely a second apparatus which works as safely and quietly. It works, however, blind. It does not "see" what is recorded by it. In the present paper a series of apparatus is shortly described which are very often used in nuclear physics. There is a device by means of which the particles can be seen. Rutherford referred to this device as "the most original and wonderful instrument in the history of science". This is the Wilson Chamber. There are various constructions of this chamber (figure 1 - fourth page of the cover). The principle remains, however, the same. Skobel'tsyn, Academician, worked a lot with these chambers and suggested

Card 1/4

an interesting improvement which is also called after him (figure 2, fourth page of the cover). There is also a chamber of very simple construction, the diffusion camera. The most wonderful one is, however, the controlled Wilson chamber. The first recording apparatus of nuclear radiation was the photoplate. The photomethod was, however, replaced by more correct measuring methods. Only the papers by the Soviet scientists L. V. Mysovskiy and A. P. Zhdanov used again photoplates in modern science. In the very beginning of the development of nuclear physics the English scientist constructed a very simple and convenient apparatus - the spinthariscope - by means of which particles were observed at that time. Numerous interesting discoveries were made by means of this apparatus. After a certain time the spinthariscope was, however, forgotten. Only as late as 1947 the scintillation method was used again. At that time mighty apparatus were constructed which transform the photoenergy into electronic energy. Their work reminds of the avalanche of electrons formed in the Geiger counter. The indisputable advantages of the scintillation counters have made them famous. They are now used in the

laboratories to such an extent that they begin to replace ionization apparatus. There is also a recording device which is often mistaken for the scintillation apparatus. This is the crystal counter which according to its principle reminds of the ionization apparatus and is at the same time similar to the scintillation counter. In nuclear physics always several measuring methods are necessary in order to be able to control at any time. The counter by Cherenkov measures excellently and very accurately the velocities of particles. One of the most **ingenious** apparatus in nuclear physics is the camera by Zavoyskiy. Properly it is a favorable combination of a luminescence counter and **Wilson chamber.** It combines the advantages of these apparatus and avoids their shortcomings (Figure 3 - fourth page of the cover). Finally the bubble chamber is mentioned (Figure 4 - fourth page of the cover). It has a very simple, but promising construction.

Card 3/4 There are 5 figures.

Chasing the Invisible 29-58-6-6/19

1. Nuclear physics--USSR 2. Radiation counters--Performance 3. Cloud chambers--Performance 4. Particles--Visibility

Card 4/4

SMAGIN, B.I.; BERKOVA, N.M., otv.red.; NAYDENOVA, I.G., tekhn.red.

[Universal energy; collection of stories on electricity] Universal'naia energiia; sbornik rasskazov ob elektrichestve. Moskva, Gos.izd-vo detskoi lit-ry M-va prosv.RSFSR, 1959. 364 p. (MIRA 13:7)

(Electricity--Juvenile literature)

OVCHINNIKOVA, V.; SMAGIN, B.

Radio equipment used in medicine. IUn.tekh. 3 no.3:15-17 Mr '59. (MIRA 12:4)

(Radiotherapy)

SMAGIN, B.I.

Conference of the All-Union Institute of Research on Medical Instruments and Equipment, Moscow, November 1958. Med.rad. 4 no.2:91-92 F '59. (MIRA 12:4)
(MEDICAL INSTRUMENTS AND APPARATUS)

ARTEM'YEV, I.A.; BERKOVA, N.M., otv.red.; SMAGIN, B.I., otv.red.;
PROZOROVSKAYA, R.I., tekhn.red.

[Radar in everyday use] Budni radiolokatsii. Moskva, Gos.
izd-vo detskoi lit-ry M-va prosv.RSFSR, 1960. 286 p.
(MIRA 14:4)

(Radar)

LYASS, F.M.; SMAGIN, B.I.

Using the scanning method for closer localization of tumors of the spinal cord. Med. rad. 5 no.1:51-52 Ja '60. (MIRA 15:3)

1. Iz rentgeno-radiologicheskogo otdeleniya (zav. - prof. M.B. Kopylov) Instituta neyrokhirurgii imeni akademika N.N. Burdenko AMN SSSR i radiologicheskoy laboratorii (zav. I.K. Tabarovskiy) Vsesoyuznogo nauchno-issledovatel'skogo instituta meditsinskogo instrumentariya i oborudovaniya.
(SPINAL CORD--TUMORS)

SMAGIN, Boris Ivanovich; NOVOSEL'TSEVA, O.N., otv. red.; BEGICHEVA, M.N., tekhn. red.

[Noisy atom] Shumnyi atom. Moskva, Izd-vo "Detskii mir," 1961. 66 p. (MIRA 14:12)

(Atomic energy)

SMAGIN, B.

On the far seashore. Izobr. i rats. no. 4:37-39 Ap '61.
(MIRA 14:4)
(Bekdash—Glauber's salt)

S/004/62/000/002/001/004
D228/D301

AUTHOR: Smagin, B.

TITLE: Capital of Siberian science

PERIODICAL: Znaniye-sila, no. 2, 1962, 1-5

TEXT: The author describes his visit as a tourist to the academic township at Novosibirsk. This scientific center which comprises 14 institutes, comes under the auspices of the Sibirskoye otdeleniye Akademii nauk SSSR (Siberian Division, Academy of Sciences, USSR) and is directed by M.A. Lavrent'yev. A feature of the Institut gidrodinamiki (Institute of Hydrodynamics) is the high-pressure hydraulic excavator designed by Engineer B. Voytsekhovskiy. Experiments being carried out under the supervision A. Deribas are briefly mentioned: their objective is to assess the affects of explosively-propagated waves of water on ships and barges. Another institution visited by the author was the Teoreticheskiy otdel Instituta eksperimental'noy biologii i meditsiny (Theoretical Section, Institute of Experimental Biology and Medicine). Here, Ye.N. Meshalkin is directing

Card 1/2

Capital of Siberian scienc

various histologic, pathologic and physiologic investigations, in particular the study of the changes occurring in living tissue during and after clinical operations. Scientists of the Novosibirskiy institut geologii i geofiziki (Novosibirsk Institute of Geology and Geophysics) are studying a large number of relevant problems, from the vast coal potential of Siberia to the earth's internal structure, in which respect a series of very deep boreholes is planned for the future. Turning to the work of the center s cytology and genetics sections, it is noted that recent research on chromosomes has resulted in their number being increased twofold. The properties of desoxyribonucleic acid are at present being considered by R.I. Salganik et al. Much of the activity of the Institut matematiki akademika S.L. Soboleva (Mathematics Institute of Academician S.L. Sobolev) is taken up with the celebrated electron-calculating machine. The Institute's mathematicians are also developing new machines with molectronic devices, memory films, cryotron films, etc. One of their latest ideas is to perfect an ultra-miniature molecular magnet. In conclusion, the author mentions the expanding university and his meeting with A.M. Budker, lecturer in recent physics. Mathematical and physical "Olympiads" are being contemplated throughout Siberia for the purpose of selecting the center's future scientists.

SMAGIN, Boris

House on a quay. Znan.-sila 37 no.11:25-28 N '62. (MIRA 16:1)
(Electric power distribution) (Electric network analyzers)

SMAGIN, Boris Ivanovich; KANTER, A.I., red.; RAKITIN, I.T., tekhn. red.

[Useful cold] Poleznyi kholod. Moskva, Izd-vo "Znanie," 1963. 37 p. (Narodnyi universitet kul'tury: Tekhniko-ekonomicheskii fakul'tet, no.3) (MIRA 16:5)
(Low temperature research)

SMAGIN, Boris Ivanovich; KROSHKIN, M.G., kand. fiz.-matem.nauk, red.; KILLEROG, N.M., red.

[Space and science] Kosmos i nauka. Kiev, Naukova dumka, 1964. 97 p. (MIRA 17:10)

SMAGIN, D.V., inzh.; SHUBIN, A.A., inzh.

Power supply of electronic VTI controllers with unstabilized 120 volt current. Energetik 11 no.7:10-11 Jl '63. (MIRA 16:8)

(Electric controllers)

ZAKHARIEVICH, I.A.; [illegible], D.V.; [illegible], A.N.; [illegible], S.F., kand. tekhn. nauk, retsenzent

[Concise manual on automatic controllers of boiler systems] Avtomaticheskie reguliatory kotel'nykh ustanovok; kratkii spravochnik. Moskva, Izd-vo "Mashinostroenie, 1964. 175 p. (MIRA 17:7)

SMAGIN, D.V., inzh.

Operation of the technological protection systems of power stations with transverse couplings in the Sverdlovsk Electric Utility System. Energetik 13 no.1:3-6 Ja '65. (MIRA 18:3)

CA

11C

Vitamin C in duodenal contents in liver disease. G. A. Simagin. *Klin. Med.* (U.S.S.R.) 26, No. 7, 41-5(1948).—Two groups of patients were studied, 41 with parenchymatous hepatitis and 27 with nonhepatic disease. Vitamin C (I) was detd. in duodenal contents and in blood, before and after intravenous injection of 1 (10 cc. of 10% soln.). In the latter group of patients, 12 out of 17 excreted I into the duodenum before loading, and all excreted 0.08–1.7 mg. per 100 cc. after the intravenous injection. All patients with hepatitis excreted I into the duodenum before and after loading, in concns. 1.5–2 times those in the nonhepatic group. B. A.

SMAGIN, G.A., prof.; DOROFEYEV, G.I., kand.med.nauk

Clinical and physiological principles in the compound therapy of peptic ulcer. Terap.arkh. 31 no.8:56-61 Ag '59. (MIRA 12:11)

1. Iz kafedry terapii No.2 dlya usovershenstvovaniya vrachey (nach. - prof. G.A. Smagin) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M. Kirova.
(PEPTIC ULCER, therapy)

SMAGIN, G.A., general-mayor meditsinskoy sluzhby, professor

S.P. Botkin and problems of military therapy; on the 70th anniversary of his death. Voen.-med. zhur. no. 1:90-92 Ja '60. (MIRA 14:2)
(BOTKIN, SERGEI PETROVICH, 1832-1889)

SMAGIN, G.A.; BRUSAKOV, M.I.

Pathogenesis and treatment of chronic gastritis. Klin. med. 38 no. 4:18-22 Ap '60. (MIRA 14:1)
(STOMACH--DISEASES)

SMAGIN, G.D., zasluzhennyy uchitel' shkoly RSFSR (s.Atmis Nizhnelomovskogo rayona Penzenskoy oblasti).

First diary of phenological observations. Biol. v shkole no.2:63-66 Mr-Ap '61. (MIRA 14:3)

(Phenology—Study and teaching)

CHUVATOV, V.V.; BEREZIN, N.N.; METSGER, E.Kh.; NAGIN, V.A.; KARTASHOV, N.A., kand. tekhn. nauk, dots.; MIL'KOV, N.V., kand. tekhn. nauk; BYCHKOV, M.I., kand. tekhn.nauk, dots.; SUKHANOV, V.P., SHLYAPIN, V.A.; KORZHENKO, L.I.; ABRAMYCHEV, Ye.P.; KAZANTSEV, I.I.; YARES'KO, V.F.; LUKOYANOV, Yu.N.; DUDAROV, V.K.; BALINSKIY, R.P.; KOROTKOVSKIY, A.E.; PONOMAREV, I.I.; NOVOSEL'SKIY, S.A., kand. tekhn.nauk, dots.; IL'INYKH, N.Z.; TSITKIN, N.A.; ROGOZHIN, G.I.; PRAVOTOROV, B.A.; ORLOV, V.D.; RACHINSKIY, M.N.; KULTYSHEV, V.N.; SMAGIN, G.N.; KUZNETSOV, V.D.; MACHERET, I.G.; SHEGAL, A.V.; GALASHOV, F.K.; ANTIPIN, A.A.; SHALAKHIN, K.S.; RASCHEKTAYEV, I.M.; TISHCHENKO, Ye.I.; FOTIYEV, A.F.; IPPOLITOV, M.F.; DOROSINSKIY, G.P.; ROZHKOV, Ye.P.; RYUMIN, N.T.; AYZENBERG, S.L.; GOLUBTSOV, N.I.; VUS-VONSOVICH, I.K., inzh., retsenzent; GOLOVKIN, A.M., inzh., retsenzent; GUSELETOV, A.I., inzh., retsenzent; KALUGIN, N.I., inzh., retsenzent; KRAMINSKIY, I.S., inzh., retsenzent; MAYLE, O.Ya., inzh., retsenzent; OZERSKIY, S.M., inzh., retsenzent; SKOBLO, Ya.A., dots., retsenzent; SPERANSKIY, B.A., kand. tekhn. nauk, retsenzent; SHALAMOV, K.Ye., inzh., retsenzent; VOYNICH, N.F., inzh., red.; GETLING, Yu., red.; CHERNIKHOV, Ya., tekhn. red.

[Construction handbook] Spravochnik stroitelia. Red.kollegiia: M.I. Bychkov i dr. Sverdlovsk, Sverdlovskoe knizhnoe izd-vo. Vol.1. 1962. 532 p. Vol.2. 1963. 462 p. (MIRA 16:5)
(Construction industry)

NAZIROV, R.K.; SMAGIN, I.F.; KHACHATURYAN, S.A.

Designing and building the first experimental precast reinforced concrete movable pier in the Zyrya-More marine oil field. Azerb. neft.khoz. 40 no.12:47-50 D '61. (MIRA 15:8)
(Apsheron region--Artificial Islands)
(Precast concrete construction)

NAZIROV, R.K., inzh.; SMAGIN, I.F.; KHACHATURYAN, S.A., kand. tekhn. nauk [deceased]; DOBSHITS, M.L., inzh., red.

[Construction of precast reinforced concrete offshore piers; work practice of the Azerbaijan offshore Construction Trust] Stroitel'stvo morskikh transportnykh estakad iz sbornogo zhelezobetona; opyt raboty tresta "Azmorneftestroi." Moskva, Gosstroiizdat, 1963. 20 p. (MIRA 17:7)

1. Akademiya stroitel'stva i arkhitektury SSSR. Nauchno-issledovatel'skiy institut organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu. 2. Direktor Gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta morskoy nefti (for Nazirov). 3. Glavnyy inzhener proyekta zhelezobetonnykh sooruzheniy Gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta morskoy nefti (for Smagin). 4. Nachal'nik otdela zhelezobetonnykh sooruzheniy Gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta morskoy neft (for Khachaturyan).

SOV/106-58-6-3/13

AUTHORS: Khlytchiyev, S.M., Aleksandrov, G.A., Dourt, Yu.N. and Smagin, I.I.

TITLE: (The Path of) **Automation** of Radio-reception **Centers** (Puti avtomatizatsii radiopriyemnykh tsentrov)

PERIODICAL: Elektrosvyaz', 1958, Nr 6, pp 13 - 20 (USSR)

ABSTRACT: The article is published as a basis for discussion and readers are invited to comment on the problems raised in it. Methods of **automation** which are applicable to productive processes cannot be mechanically applied to communications, but some of the concepts and solutions can undoubtedly be used to improve the stability, capacity and efficiency of communication links, particularly short-wave radio links.

Classification of the Principles of Automatic Radio-reception Centres:

Radio-receivers can be classified according to the geographical location of the basic equipment groups - radio-reception centre and the radio office. The antennae must be placed in an area relatively free from industrial noise. Geographical separation of the terminal equipment from the antennae and the head amplifiers is

Card 1/8

Centre with Remote Control:
With remote control from a control desk, it is necessary to control a variety of operations, such as switching in and out of receivers, tuning of receivers, switching of antennae, of terminal equipment, etc. It is also necessary to check that the required operations have been performed. The general block diagram of a remote control system is shown in Figure 1. Here ΔCY is the control signal transmitter; ΠCY is the control signal receiver; $И)_1$, $И)_2$, .., $И)_n$ are the control executive members. Full lines show the control signal paths, and the dotted lines show the path of signals confirming the operations. Specific systems can be divided according to the type of executive members used, by the method of confirming fulfilment of the operations, by the form of the control signals and by the method of transmission (Refs 1, 2).
Centres with Programmed Control:
The classification and terminology given in Ref 5 are used in this article. Automatic systems are divided into three groups: 1) Systems of automatic "hard" control;

(The Path of) **Automation** of Radio-reception **Centers**

2) Systems of automatic regulation; 3) Self-changing or self-regulating systems. Analysis of operational data of the Ministry of Communications radio-reception centres show that: a) The wave timetable to each correspondent is given monthly and is not changed over the given priod; b) Over a period of 24 hours, the given waves are changed in accordance with a programme, corrected by the operator to correspond to the factual propagation conditions over the given route. Quite a large deviation in changeover time (up to several hours) often occurs; c) The manner of working and speed is given quarterly and is not changed over the quarter; d) The antennae are tied to the correspondent but can in some cases be changed; e) During operation, the receiver is frequency-trimmed by the duty technician whenever the signal quality worsens or when requested to do so from the radio office.
From the above, control of the majority of the operations is possible on the basis of a "hard" programmed automatic control sequence. For this, controlling apparatus, to switch in the executive members, a memory, to store the programme and a decoder, to produce the control signals as

required by the programme, are necessary. Facilities for fulfilling special requirements, as they occur, are also necessary. By introducing limited logical circuits, automatic control can, to some extent, replace the judgment of human operators. The presence of arithmetical apparatus in the controlling machine significantly widens its possibilities, makes it more universal and reduces the size of the memory necessary to store the programme. A fundamental deficiency of the "hard" automatic control system is that to preserve optimum quality of the signal, the programme must be adjusted from the radio office whenever the propagation conditions change. To overcome this deficiency, self-regulating systems are required, for which electronic controlling machines are most suitable.

In the self-regulating system, there is extra equipment Y_2 (Figure 3) as well as the basic controlling apparatus Y_1. Y_2 receives signal data from the receiver output, transmitter frequency data, receiver tuning data, information from the radio office, etc. and evaluates the signal quality from

this data. It then acts upon Y_1 to maintain the optimum signal quality.

Radio-reception Centres with Automatic Programming: Statistical data, characterising the features of each radio link, can be accumulated in the memory. The controlling apparatus itself can then use this data to introduce corrections into both the wave timetable and into other parts of the programme and, furthermore, it can devise a new programme to meet the requirements of an originating correspondent, i.e. the reception centre would have automatic programming facilities. Such a centre would search for the calling correspondent and then switch to directive working. Search receivers would find the correspondent's carrier frequency. On the basis of the correspondent's data and analysis of the incoming signal, the controlling apparatus selects a free receiver and adjusts the equipment to suit the modulation, the nature of the work, the frequency, etc. and when ready, sends a ready signal to the transmitting station through the radio office. Automatic programming, however, requires not only new and very complicated equipment but also re-organisation of the methods of radio communication.

(The Path of) **Automation** of Radio-reception **Centers**

Thus, it is a long-term problem.
Conclusions: Radio-reception centres with programmed control are a more immediate task and such centres can be introduced gradually by replacement of existing centres or by re-equipment. A number of associated problems then arise due to: 1) Some types of existing equipment are not suitable for automatisation; 2) Prototypes, and in some cases, even the design principles of instruments for objective measurement of the radio signal quality have not been developed; 3) Measuring instruments constructed to meet the requirements of computing electronic machines are not available; 4) Sufficient experience in the design of self-tuning and self-regulating systems has not yet accrued.

Card 7/8

SOV/106-58-6-3/13

(The Path of) **Automation** of Radio-reception **Centers**

There are 4 figures and 6 references, 5 of which are Soviet and 1 English.

SUBMITTED: August 12, 1957

1. Communication systems--USSR 2. Radio stations--Control systems
3. Noise (Radio)--Measurement 4. Personnel

Card 8/8

SMAGIN, I.N. (Sverdlovsk)

Report of a case of myoclonus epilepsy with a pathoanatomical examination [with summary in English]. Arkh.pat. 21 no.1:49-54 '59. (MIRA 12:1)

1. Iz Sverdlovskoy psikhonevrologicheskoy bol'nitsy No.1 (nauchnyy konsul'tant - prof. P.F. Malkin) i otdela morfologii TSentral'noy nervnoy sistemy (zav. - prof. A.P. Avtsyn) Gosudarstvennogo instituta psikhiatrii Ministerstva zdravookhraneniya RSFSR.
(EPILEPSY, pathology,
myoclonus, autopsy findings (Rus))

SMAGIN, I.S., dotsent, kand.tekhn.nauk

Evaluating the economic effectiveness of reducing the time expended in constructing railroads. Trudy MIIT no.14:412-424 '59. (MIRA 13:1)

1. Leningradskiy institut inzhenerov zheleznodorozhnogo transporta imeni V.N.Obraztsova.
(Railroads--Cost of construction)

SHADRIN, Nikolay Aleksandrovich, prof.; PERKL'MAN, Lev Moiseyevich, dotsent; REPREV, Andrey Ivanovich, dotsent; SMAGIN, Ivan Sergeyevich, dotsent; UL'RICH, Sergey Sergeyevich, dotsent. Prinimali uchastiye: KHACHATUROV, R.A., dotsent; SHURYGIN, V.P., kand.tekhn. nauk; MOZES, B.N., inzh.; ALEKSEYEV, V.N., ekonomist. GRINEVSKIY, I.A., inzh., red.; KHITROV, P.A., tekhn.red.

[Railroad construction] Stroitel'stvo zheleznykh dorog. Pod red. N.A.Shadrina. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1960. 344 p. (MIRA 13:9)
(Railroads--Construction)

SMAGIN,M.A.

Centralized control of ATN-10 pumps. Rats. i izobr. predl. v stroi. no.97:17 '54. (MLRA 8:7)

1. Trest Burvodstroy Ministerstva stroitel'stva SSSR.
(Pumping machinery)

SMAGIN, N.A.

Introducing the 56 automatic grinding machine for grinding grooves of outer races. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 18 no.3:24-25 Mr '65. (MIRA 18:5)

KHAMSKIY, Ye.V.; LEVCHENKO, V.[illegible], V.G.; SMALIY, E.I.

Ultrasonic method used for determining small amounts of water in methanol. Zav.lab. 28 no.3:312-313 '62. (MIRA 15:4)

1. Nauchno-issledovatel'skiy i proyektnyy institut azotnoy promyshlennosti i produktov organicheskogo sinteza.
(Methanol) (Water) (Ultrasonic testing)

DROZDOV, N.S.; SMAGIN, P.V.; KOLEDIN, I.Ye.

Practice in electric-erosion machining of materials of industrial enterprises of the Moscow City Economic Council. Biul.tekh.-ekon. inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. 16 no.10:95-97 '63. (MIRA 16:11)

PEVNEV, Nikolay Ivanovich; SMAGIN, Pavel Vasil'yevich; FURSOV, Nikolay Dmitriyevich; MOZGALEVSKAYA, S.A., red.; PONOMAREVA, A.A., tekhn. red.

[Public inspection in enterprises] Obshchestvennye smotry na predpriiatiiakh. Moskva, Ekonomizdat, 1963. 102 p. (MIRA 17:1)

SMAGIN, P.V.

Introduction of multiple machining processes in enterprises of the Moscow City Economic Council. Mashinostroitel' no.1:10-11 Ja '64. (MIRA 17:2)

ACCESSION NR: AP4025017 S/0062/64/000/003/0583/0584

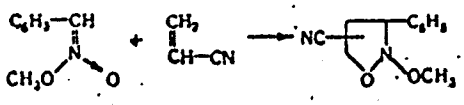
AUTHORS: Tartakovskiy, V.A.; Chlenov, I.Ye.; Smagin, S.S.; Novikov, S.S.

TITLE: Nitrocompounds obtained by 1,3 dipolar addition reaction

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 3, 1964, 583-584

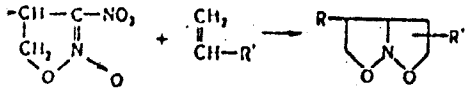
TOPIC TAGS: nitrocompound, 1 3 dipolar addition, addition reaction, phenylnitromethane, acrylonitrile, diazomethane, trinitromethane, nitroisoazolidine series, trivalent nitrogen, covalent bond, dinitrocompound

ABSTRACT: This addition reaction between the aciform and unsaturated nitrocompounds, such as between the *O*-methyl ether of phenylnitromethane and acrylonitrile, may proceed as follows:



Card 1/3

yielding N-methoxy-3-phenylnitriloisoxazolidine. Such end products, which may be considered cyclic ethers of aciform dinitrocompounds will react further with formation of heterocyclic compounds of a new class, the isoxazolidine derivatives.



The O-methyl ether of trinitromethane (prepared from diazonethane and trinitromethane) can also enter into such 1,3 addition reaction. These compounds of the isoazolidine series are the first examples of substances containing a trivalent nitrogen atom, covalently linked to 2 oxygen atoms. Orig. art. has: 2 formulas.

ASSOCIATION: Institut organicheskoy khimii im. N.D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry, Academy of Sciences, SSSR)

ACCESSION NR: AP4025017

SUBMITTED: 11Dec63 DATE ACQ: 17Apr64 ENCL: 00

SUB CODE: CH NR REF SOV: 000 OTHER: 000

Card 3/3

TARTAKOVSKIY, V.A.; SMAGIN, S.S.; CHLENOV, I.Ye.; NOVIKOV, S.S.

Methyl ester of phenylnitromethane in the reaction of 1,3-dipole cycloaddition. Izv. AN SSSR. Ser. khim. no.3:552-554 '65. (MIRA 18:5)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

PISHCHURIN, A., inzh.; SMAGIN, V., inzh.

Corrosion control with resins. IUn. tekh. 5 no. 12:20-21 D '60. (MIRA 14:1)

(Corrosion and anticorrosives) (Resins, Synthetic)

GLAZUNOV, V.N.; SHAGIN, V.A.; STRELKOV, V.M.

Investigating rotary impact boring of holes in hard rock.
Gor. zhur. no.10:32-38 O '58. (MIRA 11:10)
(Boring machinery)

S/048/61/025/012/016/022
B117/B104

AUTHORS: Mishin, D. D., Bychkova, T. I., and Smagin, V. A.

TITLE: Effect of magnetic field strength on the magnetic properties of cold-rolled electrotechnical steel in thermomagnetic treatment

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1961, 1498 - 1502

TEXT: The effect of the magnetic field strength on the magnetization curve and on the hysteresis loop of cold-rolled crystallographically textured electrotechnical steel of the type Э310 (E310) was investigated. Ring-shaped samples 7 cm in diameter were used. They were produced from strips (23·3·0.05 cm) annealed for 5 hr at 1100°C in hydrogen. The ends of the samples were welded together. The strips were cut out longitudinally, transversely, and at an angle of 55° to the rolling direction. Thus, it was possible to investigate the magnetic properties in the tetragonal, digonal, and trigonal direction of the iron pseudomonocrystal with